UNESCO AND THE POLITICS OF INTERNATIONAL COOPERATION IN THE REALM OF SCIENCE

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Unesco is one of the family of intergovernmental organisations that emerged with the United Nations. As such Unesco will soon be celebrating the 50th anniversary of its founding.

Towards the end of World War II when representatives of what was to be the victorious side met to discuss the design of a new intergovernmental organisation for international cultural and educational exchange, the place of science was at first not included in these deliberations. It was largely thanks to the efforts of a couple British scientists, Joseph Needham and Julian Huxley, who were strongly commited to developing international cooperation in their own realm that the "S" was included in the new organisation's official mandate and acronym. Needham, a Christian Marxist, was a member of the group of Bernalists who advocated the need for better planning and more social responsibility, especially with regard to the social function of science; this included the function of serving independence, economic development and widening the base of science-based knowledge in those parts of the globe that had been colonized by Western nations. Huxley, a famous biologist, affiliated to the Social Responsibility of Science movement in Britain in the 1930s, became the first Director General of Unesco, a position from which he was instrumental in pushing the same line as Needham, seeking to develop the organisation as a vehicle for actively moving science and scientific cooperation beyond the metropolis.

International cooperation in the realm of science in the context of Unesco is thus a question that has a direct bearing on the topic of this book. Indeed Unesco may be seen, in part, as a window on the advances made historically in this direction, as well as various obstacles in the way. The declared intent of Unesco is universality. In the realm of science this translates into the proposition that science is a public good, which should in principle be accessible to all people, irregardless of race, creed, class or geographic location. This is the ideal. In practice it is difficult to realise, since the political economy of resources needed to access science is heavily skewed in favour of the industrial nations and to the great disadvantage of the Third World. Resources in this context includes not only material wealth but also cultural resources in the form of higher education and research training that are a prerequisite for being able to appropriate

the most advanced scientific knowledge and put it to work in one's own country. Overcoming such problems and laying the groundwork for a minimal level of scientific capacity were high up on Unesco's agenda when this organisation was founded directly after the war. One of the ideas put forward was the institution of truly international scientific facilities which might be used by researchers from whatever nation that wished to do so. As it turned out this idea was only realised in a few very exceptional cases; today it still remains as an ideal that comes up again every once in a while to fire new debates and visions of what a more just future might look like in the realm of science.

The aim of the present chapter is to consider some of the concepts relating to international scientific cooperation advanced by Huxley and Needham, and to trace some of the efforts expended both by them and others who followed in trying to realise the vision of a better world. Here it is important at the outset to make clear a distinction between two aspects of scientific internationalism, one material instrumental, the other rhetorical, since these were important elements in legitimating Unesco's efforts in the realm of science.

At one level scientific cooperation between groups and across national boundaries is motivated by a need to develop common standards of reference that can be applied in observation, data sets, calibration of instruments, experimental procedures and protocols, definitions of basic scientific constants and units of measurement, etc. This has been and still is an important motive force in the emergence and development of scientific associations, both nationally and internationally. At another level scientific cooperation, especially when it is carried out in the name of scientific internationalism, takes on an ideological quality. Reference is made to the ethos of science, as in the case of the Mertonian scheme of the four norms – intellectual communism, universalism, disinterestedness and organised scepticism – which are supposed to exist as a kind of moral glue, in the absence of which science would not function. This ethos nurtures the notion that science is the common product of humankind, and that scientific knowledge is a public good for the benefit of all humankind. In spite of the fact that this symbolic construction of an ideal state of affairs in many cases deviates considerably from the life of real science in the real world, while at the same time being apostrophied as if it really existed, I refer to it as ideological and rhetorical. This does not mean that it carries less force as part of the mythology of scientific culture, or as an ideal for policy makers to pursue.

Within Unesco the internationalist ideal was propounded in quite different terms than what had been done by the organisation which preceded Unesco in its role as a locus for transnational cooperation, viz. the International Committee for International Cooperation (ICIC) under the League of Nations. Unesco, apart from explicitly bringing science into the picture, tried both to broaden the scope of intellectual cooperation beyond a predominantly eurocentristic mode, and to put greater emphasis on the material instrumental level compared to the rhetorical-ideological one. Here is not the place to delve into the history of the ICIC; suffice it with a few words necessary to understand some of the background to the formation of Unesco.

The International Committee for Intellectual Cooperation (ICIC) created under the auspices of the League of Nations was an elitist organisation. The rationale behind it

was that an assembly of world luminaries would rise above the conflicts that otherwise divided nations along ideological, political and other lines. In order to keep up the semblance of unity, controversial issues of the interwar years were ignored. The result was, as Catharina Landström has described, a situation of increasing impotency (1). In the face of advancing fascism, ICIC lacked the teeth necessary to make a dent on world opinion. Official ostrich-like neutrality was exploited by aggressor nations to groom a false image of their still being civilised and cultured.

These negative lessons of the ICIC experience were not forgotten as the Second World War drew to a close. Instead it weighed heavily on the minds of the architects of the new international forum for cultural and scientific exchange that was to replace the ICIC, namely the United Nations Educational, Scientific and Cultural Organisation (Unesco), dating from preparations in the Fall of 1945. Unesco's Constitutional Conference, held in London, followed shortly upon the founding conference of the United Nations in San Francisco, where there had been a call to create a world educational organisation.

Long before the war ended efforts were afoot amongst Allied countries to create an international body through which governments could more forcefully interact amongst each other on a multilateral basis in the realm of culture and education. The inclusion of the "S" in Unesco was an innovation introduced at the tail end of the constitutional proceedings. It was taken up only as a result of the lobbying of a number of very articulate British scientists who had the ear of the UK Minister of Education. They were people who had been active in the Social Responsability of Science (SRS) movement of the 1930s. Their involvement in Unesco affairs served as a point of continuity with a more radical tradition of thinking on science in society than the one which had given birth to ICIC.

Of course the hopes projected into Unesco were not purely altruistic. The Allied victors were determined to use the new organisation, whatever its final shape, to promote their own views of the "Open Society". It was a time of sharpening ideological differences over the meaning of fundamental concepts like democracy and freedom. In the realm of philosophy the analytical school of the Anglo-American world gained ground in the wake of the post-war military and security order and Marshall plan assistance. Its advocates offered linguistic and conceptual analysis as a tool for eliminating misunderstanding and therewith grounds for conflict. This analysis was presented as impartial and objective, whereas in fact it betrayed a constant bias towards Western liberal conceptions, which were draped in universalist garb. Enlightenment was implictly equated with accepting the norm of the free market as the most rational. Civil servants working in the framework of Unesco did not always accept the extremes of this essentially capitalist ideology, but they too tended to affirm the scientism and eurocentrism that came with it. The major tension that existed was with forces and concepts outside the Unesco framework, i.e. the Soviet Union and soon also by extension Eastern Europe, where freedom and democracy as fundamental concepts followed a different logic.

Since the Soviet Union did not participate in Unesco until after Stalin's death, the basic ideological conflict in the immediate post-war period was mostly externalised. Instead conflicts arising from national rivalry, differences of cultural and political traditions

amongst Unesco member states came into the foreground. One of the differences revolved around two mutually contradictory views of the organisation: a non-governmental *contra* an intergovernmental construction. Elitism inspired by the former French connection (ICIC) co-existed with Anglo-American pragmatism and even populism. The net result was that Unesco, even if someone had wished it to do so, could not function as a mere extension of political interests into the spheres of culture, education and science. Each of these spheres had its own logic of development, irreducible to brute politics, so that the play of conflicts on the geopolitical arena underwent complex transformations in each particular case. Within the framework of an overall Western bias there was some room for independent initiatives that went against mainstream politics. This was particularly true in the realm of science, since it was considered to be ideologically neutral territory, at least in its ideal contents, if not always in function and social impact. Unesco's Science Department was a place where residues of the more radical strain of social responsibility from the 1930s could continue to a degree that was not possible in education and culture.

In what follows I shall consider Unesco in its genesis, and thereafter focus on some details in the first decade and a half of its existence. It will be found that at first Western ideological bias was so widely accepted by member countries that it was hardly challenged from within. This meant that there was a successive process of far reaching technisation. In 1954, when the Soviet Union entered ideological conflict was avoided by further reinforcement of an instrumentalist view of science and culture. In the West this coincided with convergence theory, the notion that industrial and technological development led to a post-industrial society, the same in all parts of the world, independent of ideological and political differences. From the Soviet side this notion fitted hand in glove with a technocratic understanding of the theory of scientific-technological revolution which became a centerpiece in what was called the "science of science". Scientism in turn fitted perfectly with the dominant philosophy within Unesco propagated by the first Director General, the biologist Julian Huxley. In the following, therefore, attention will also be focused on Huxley's evolutionary epistemology.

Genesis, Split Heritage, and Western Bias

The invitation to Unesco's constitutional conference already signalled the complexity of diplomatic maneuvering. Formally the invitation to the participating countries was issued jointly by the UK and France, the former by virtue of its strong hand as free nation and European liberator at the end of the war, the latter in recognition of a continuity with the older ICIC, which was now dissolved. During the London negotiations it so transpired that two rival plans for a new organisation were tabled, one grafted from earlier British and American plans, the other a French plan. The first was a compromise founded on pragmatism and large power interests, the second reflected the interests of a government more ready to incorporate new democratic forces and the wish to bring the headquarters for the new operation to Paris. Soviet observers included in previous talks boycotted the meeting; the seat created for the Soviet Union remained vacant, until 1954.

Unesco's double heritage brought with it two quite different approaches to transna-

tional interchange in the field of science (2). One stemmed from the ICIC affiliated International Institute for Intellectual Cooperation (IICI with offices in Paris) and France, together with some other nations, the other from the much newer Atlantic Alliance, in the form of the Conference of Allied Ministers of Education (CAME), a highly pragmatic arrangement that had been meeting in London since 1942, assembling there Ministers of Allied countries together with persons charged with similar responsibility for educational affairs within the London-based exile governments of occupied countries. The French approach called for the institution of an organization with strong non-governmental representation; the UK-US approach favoured the formation of a world-wide organisation with strong control by Member States, i.e. an intergovernmental construction.

While the latter proposal won out, French interests were partly accommodated by incorporating some of the staff of the old IICI into the Preparatory Commission which was to do the groundwork for the First General Conference. This occurred in Paris where the new agency was formally inaugurated the 4th of November 1946, the day the constitution came into force through ratification by its twentieth Member State, Greece (3). The site chosen in Paris was also replete with symbolism. It was the Hotel Majestic on Avenue de Kléber, the former German headquarters during the occupation period. Julian Huxley later wrote how his Director's room "had the 'distinction' of having been the office of the notorious nazi Commandant of Paris. Thus my occupancy symbolized the transition from war and racialism to peace and cultural co-operation" (4).

The first members of Unesco comprised a constellation of Western Allies and their dependencies in various parts of the world. The pre-communist government of Poland came in as the 21st country. Czechoslovakia, Hungary and Yugoslavia were also among the founding states; after their orientation towards the Soviet Union they chose to stand aloof as voluntary absentees until 1954. Neutral Sweden did not join until 1950. When Italy joined in 1948, followed by Japan and West Germany in 1951, the Western position was further reinforced. Clare Wells in her careful study of ideological shifts within Unesco observes how in the UN at the time, "decisions as to which groups rightfully represented given states, or even as the boundaries of a state, were also for a long time a prerogative of the Great Powers and notably of the leading Western States" (5). René Maheu, Director General at the time of Unesco's 25th anniversary did not mince words either when, in retrospect, he observed: "...whatever the theory and intentions, Unesco was nevertheless for ten years an essentially Western organization" (6).

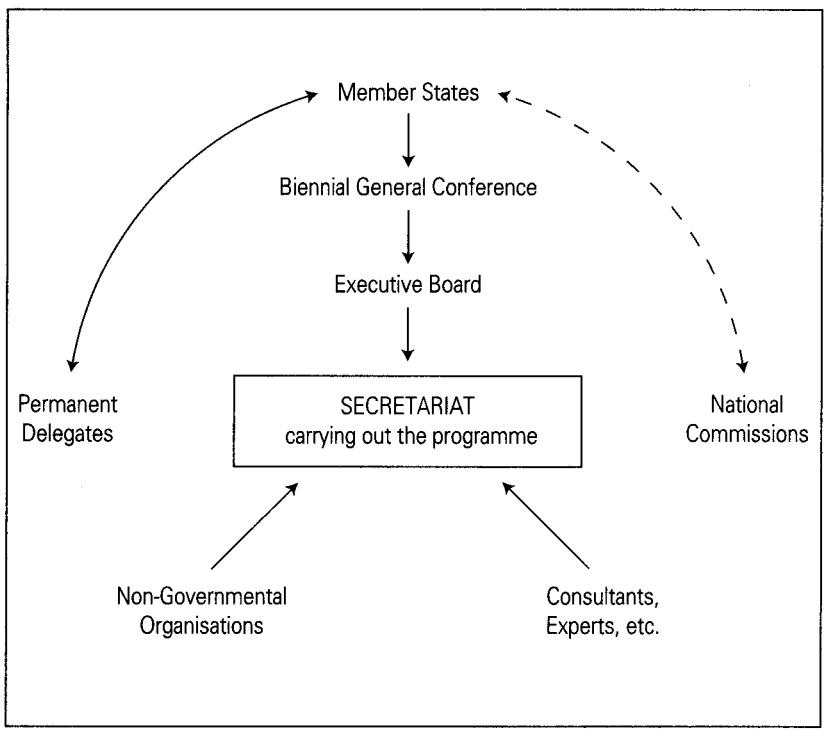
In the West the UN-system itself has been interpreted as the application of Liberal democratic doctrines to world-wide institutions of international co-operation. On this view Unesco too was a step in the history of liberalism and democracy (7). Officially then, a pragmatic liberalism and its concomittant image of science in society held sway. Inside the Organisation, however, especially in the natural sciences sector, a more radical perspective seemed to flourish, promoted by Science Directors with socialist leanings, first Joseph Needham, then Pierre Auger, followed in 1959 by Victor Kovda.

Julian Huxley in his years as Director General assumed the role of mediator between liberal pragmatic and Leftist forces in the post-war science policy arena. For this very reason he was also denounced from both the side of the Cold War warriors as these gathered their forces on the Right, and by the Communists whose positions became

more polarised at the other end of the political spectrum. Huxley welcomed the formation in 1945 of the World Federation of Scientific Workers (WFSW) which represented another, and more overtly partisan type of scientific internationalism. Its role as a non-governmental organisation, meant to mobilise the rank and file of the international scientific community, was seen as an important complement to the intergovernmental status which restricted Unesco's scope for action.

The mutual polarisation and split of the two wings of the former Social Responsibility of Science (SRS) movement was, however, soon reflected in the worsening of relations and mutual animosity between Unesco and the WFSW and took its toll (8). This grew worse once Huxley and Needham had left from key positions in Unesco. J. D. Bernal for his part became a vocal critic of Unesco, coming to refer to it as "the ideological front of the American led majority in the United Nations" (9). Bernal felt that Unesco generically, in its very conception and ideology, was inextricably linked with the notion of the superiority of Western civilisation.

Today Unesco counts over 160 member nations. Owing to its structure a General Conference of all members has considerable influence in the selection of an Executive Board and the appointment of the Director General.



Source: Hoggart, *op. cit.*, p. 3.

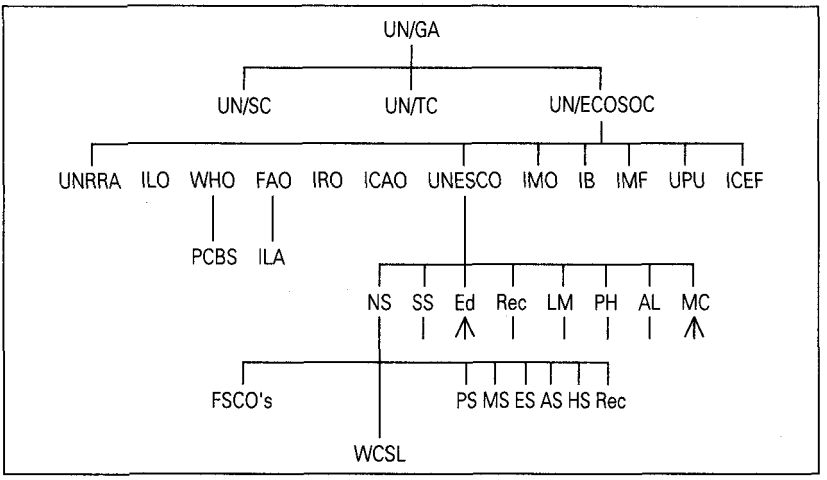
The First Decade (1945-1954)

The August 1945 launchings of the US atomic bombs over Hiroshima and Nagasaki helped drive home the importance of making explicit the role of scientists, scientific collaboration and interchange of scientific knowledge in the post-war era. This is evident from the remarks of the British Minister of Education, Ellen Wilkinson, on the final days of the Unesco constitutional negotiations: "In these days, when we are all wondering, perhaps apprehensively, what scientists will do to us next, it is important that they should be linked closely with the humanities and should feel that they have a responsibility to mankind for the results of their labours" (10).

As already indicated, the French wanted to perpetuate the IICI. For them the term "intellectual" was therefore important, and the desire to carry on educational, scientific and cultural work independent of political power. An organisation that gave priority to governmental representation, it was argued, might be impeded in its operation by the emergence of blocs which would make more difficult mutual cooperation and understanding implicit in the ideals to be pursued. Advocates of a purer intergovernmental model argued on the contrary that, since legal and economic power belongs to governments, an organisation administered by individuals with no real political standing would be impotent. Such an organisation would never get beyond the stage of philosophising and wishful thinking, of which one had already seen too much in the interwar period (11). In quite a different meeting convened later, in February 1946 to dissolve the League of Nations, the French delegate there countered similar views by arguing that the IICI had in fact been "practical, though it had never descended from the highest levels of human thought", but now, he admitted, circumstances had indeed changed and intellectuals had to be "prepared to descend a little from their dizzy heights" (12).

The majority decision at the constitutional negotiations was that the membership of Unesco's General Conference should be nation states, not transnational organisations. Thus the French proposal was rejected; their *contre-projet* called for a majority of representatives to be taken from the intellectual community. Nevertheless, a concession was made in respect to the composition of the Executive Board, which would guide Unesco affairs in between General Conferences (13). This body, elected by the politically appointed GC, could have members who would sit there in their personal capacity, chosen as far as possible from amongst leading personalities and highly qualified specialists in the fields of the arts, literature, science, education and the dissemination of learning. This formula lasted only five years. Already at the GC in Mexico City in 1947 it was questioned, and later – despite vigorous opposition from France, Belgium and Uruguay – it was changed so that the Executive Board also represented governments.

In other words, during the early years of its existence Unesco was a hybrid organisation, with a principle of universalism interpreted in non-governmental terms grafted onto an intergovernmental organisation. The argument against reliance on non-governmental activities as a primary vehicle for internationalism within the Unesco structure was that in trying to follow such a mode of operation, on several occasions decisive opportunities of anchoring policy at the highest level in governments had



The United Nations:

FAO	Food and Agricultural Organisation
IB	International Bank
ICAO	International Civil Aviation Organisation
ICEF	International Children's Emergency Fund
ILO	International Labour Organisation
IMF	International Monetary Fund
IMO	International Meteorological Organisation
IRO	International Refugees' Organisation
UN/ECOSOC	Economic and Social Council
UNESCO	UN Educational, Scientific and Cultural Organisation
UN/GA	General Assembly
UNRRA	UN Relief and Rehabilitation Administration (ended)
UN/SC	Security Council
UN/TC	Trusteeship Council
UPU	Universal Postal Union
WHO	World Health Organisation

Departments in Unesco:

AL	Arts and Letters
Ed	Education
LM	Libraries and Museums
MC	Mass Communications
NS	Natural Sciences
PH	Philosophy and Humanities
Rec	Reconstruction
SS	Social Sciences

Sections in the Natural Sciences Department of Unesco:

AS	Agricultural Sciences (incl. liaison with FAO)
ES	Engineering Sciences
FSCO's	Field Science Co-operation Offices and their headquarters Unit
HS	History of Science
MS	Medical Sciences (incl. liaison with WHO)
PS	Pure Sciences (incl. liaison with ICSU and the Unions)
Rec	Reconstruction (and scientific apparatus information)
WCLS	World Centre of Scientific Liaison (e.g. scientific literature, popularisation of science, exchange of persons, etc., etc.)

Source: Needham (1948), *op. cit.*

slipped out of one's hands (14). When the Soviet Union, followed by other Eastern bloc Member States were brought in, the intergovernmental nature of interaction was emphasised, and the previous space for non-governmental action inside Unesco was closed. In line with this, transnational interaction with non-governmental scientific arenas outside, for example the International Council for Scientific Unions (ICSU), became ever more important for Unesco.

The French perception of Unesco also differed on a few other scores. One proposal was to set up standards for participating members' behaviour in the new organisation, another to emphasise the rights of intellectuals, a third was to clearly define and develop close links with the UN. This latter proposal implied that Unesco should serve as the UN's Educational Council, as a kind of higher level advisory body, with policy guidance coming directly from the UN General Assembly. The French also envisaged a "more democratic" and a broader basis of recruitment in the formation of the National Commissions in each country, urging that these ought to base their activity on public opinion and on "*la pensée quotidienne*".

All of these proposals were defeated during the course of the constitutional negotiations. Some of them flowed from socialist values and in the minds of the representatives of many of the other governments present it smacked of interventionism, which was unacceptable. After all these defeats, in the final act Léon Blum, an ardent socialist, but also very much partisan French, grasped the opportunity to outline the great advantages of having Paris as the site of the new organisation. His nationalist fervor however was cloaked in the rhetoric of its diametrical opposite, internationalism and universalism. As he put it, "French culture has always been marked by a tendency toward universality" (15).

Unesco's Constitution gave it status as a Specialist Agency in the United Nations family, according it autonomy in its own realm of endeavour. Its official task was to lay the moral and spiritual groundwork for peace, and to uphold the democratic principles of the dignity, equality and mutual respect of men. This was predicated on the partisan idea of the oft quoted preamble of the Constitution, "since wars begin in the minds of men, it is in the minds of men that the defense of peace must be constructed". These noble words reflect clearly the negative lesson from the interwar years and ICIC: neutrality meant passivity.

Before and during the war, the operations of nazi and fascist dictatorships had captured men's minds. Now, after the war, the time had come for a restoration of spirit, a cultural revolution to regenerate, and – even more important – implement the ideals of freedom, peace and fraternity. The spirit and actions of internationalism were to counteract the destructive force of exaggerated nationalism that had held sway for over a decade (16). Further it is stated "that a peace based exclusively upon the political and economic arrangements of governments would not be a peace which could secure the unanimous, lasting and sincere support of the peoples of the world, and that the peace must therefore be founded, if it is not to fail, upon the intellectual and moral solidarity of mankind". This means "full and equal opportunities for all", "unrestricted pursuit of objective truth", and "the free exchange of ideas and knowledge" are three pillars on which to found this solidarity (17). The reference to the quest for objective truth reflects

the mainstream epistemology of the day, providing a solid constitutional basis for the scientific rationalism and evolutionism that emerged as the "Unesco ideology".

Unesco's hybrid construction left considerable leverage for initiatives undertaken in the spirit of the French approach with its emphasis on non-political elites. Julian Huxley, being something of a British maverick, did not object; indeed it fitted in very well with his own priorities in promoting peace at the level of the intellect and conscience, "or what might be termed mental and moral disarmament" (18). He was keen to put Unesco on the map as a world conscience, the apex of human cultural achievement in a Wellsian sense.

The role of ethics and warnings of the danger of "knowledge without morality" were widely discussed at the First General Conference. The dissemination and exchange of knowledge, it was stated, should not be promoted for their own sake, but linked to the cause of world peace and security. For the Western nations it meant an affirmation of the "Open Society", with "free flow of ideas by word and image".

The problem is that these terms may be loaded with different meanings, either instrumentalist or essentialist. The instrumentalist view of "free flow" makes the activity as such a virtue in its own right. There should be no holds barred – information has to flow freely across borders. According to the essentialist position it is not the form but the content of the ideas, and their connection to the primary goal of peace that count. Transmitters of ideas have a moral responsibility concerning content; thus a certain gatekeeping is needed to keep out ideas which might rekindle the flames of nationalism, or encourage the crudest forms of egoism, aggression or discrimination. Such ideas, frequent in advertising, are undesirable, while those that counter the warp of the worst excesses of the free market are desirable. Responsibility for content can therefore be used as an argument to justify the need for regulation of information on the basis of democratic ideological and political criteria of a deeper kind.

With the ascendence of the Third World nations in the 1970s, numerically and in terms of influence, this interpretation was revitalised and given a new content. This was especially in connection with a spelling out of the implications of a New Information World Order reflecting the interests of Third World countries within Unesco. This may be contrasted to the situation in 1947 when US delegates wanted to use Unesco as a platform in the style of a would-be-neutral Voice of America, aimed at the Soviet Union and Eastern Europe.

Clearly the choice between the two notions of "the free flow of ideas" is itself ideological. Apostles of the free market wishing to sell their individualistic values to others were against filters and inclined to the instrumentalist view, while socialists, giving primacy to collective goods and solidarity tended to the essentialist view. Huxley for his part emphasised social responsibility, adapting the discourse on science and society from the 1930s to post-war conditions. Now this turned out to be a minority view, caught between advocates of the Truman doctrine of containment on the one side, and the Stalin-Zhdanov doctrine of two camps (socialism vs capitalism) and two world views on the other. With the gelling of the Cold War the essentialist view of the "free flow of ideas" was gradually submerged under the more technical instrumentalist inter-

pretation. In the realm of culture the latter was the ideological counterpart of the *laisser-faire* principle in economics.

At the same time a tight curtain of secrecy was drawn around sensitive information; "atomic information", for example, admitted of no free flow. Discussion pertaining to post-war uses of atomic energy took place within the UN Security Council and the shortlived UN Atomic Energy Commission (UNAEC). Unesco's task remained to deal with less controversial matters – from the West the "Atomic Curtain" had been drawn tightly, following the same topographic boundaries as the "Iron Curtain" from the East.

The Philosophy of a World Citizen

The scientism in Huxley's concept of Unesco deserves closer scrutiny. In a now classical philosophical essay of 1946 he outlined his radical vision, depicting Unesco as the most advanced expression of the psychosocial evolution of mankind. More specifically, he called for population management, eugenics, birth control, and far reaching projects of social engineering with scientists cast in the role of world experts. He succeeded in riling up Catholic countries and conservative politicians alike. His proposals proved too radical, so that this essay which Huxley had planned as an official Unesco document ended up being published in his own name only.

Huxley's philosophy included a self-assumed meritocratic attitude reminiscent of the Liberal pragmatic idea of the scientific metropole nations having a "white man's burden". On this view Unesco should work to raise the cultural level of "backward" countries and races (19). It "should encourage all studies and all methods which can be used to ensure that men find the right jobs and are kept away from the wrong jobs... while at the same time ensuring that society is not overburdened with people in positions for which they are inadequate or, still worse, which they are likely to abuse" (20). Also, "even if it is quite true that any radical eugenic policy will be for many years politically and psychologically impossible, it will be important for Unesco to see that the eugenic problem is examined with the greatest care, and that the public mind is informed of the issues at stake so that much that is now unthinkable may at least become thinkable".

Evidently, after the war, as race hygiene had fallen into political and moral disrepute, human genetics was launched as a professionalised depoliticised scientific alternative (21).

In his capacity as global ambassador, Huxley believed Unesco could transcend the contradictions embedded in "the American versus the Russian way of life; or capitalism versus communism; or Christianity versus Marxism; or in a half dozen other ways", like "individualism versus collectivism"; he thought the organisation might lay the groundwork for a higher evolutionary synthesis. He hoped it could be a step in the direction of world government, with Unesco as a kind of "World Brain", as H.G. Wells had called it (22). Others referred to it as a "world conscience". A French philosopher even spoke of the UN as giving a "body" to internationalism, while Unesco's constitution provided the "soul".

Huxley referred to his own philosophy as a "scientific humanism". A more appropriate name would be "evolutionary scientism". It is evolution made reflexive, or rather, self-

conscious. Evolution he says has three phases, the first of which may be seen in the material world or "sector", the second in the biological, and the third in the psycho-social "sector", where humankind, with the help of science, is destined to consciously guide the whole process. "Of special importance in man's evaluation of his own position in the cosmic scheme and of his further destiny is the fact that he is the heir, and indeed the sole heir, of evolutionary progress to date. When he asserts that he is the highest type of organism, he is not guilty of anthropocentric vanity, but is enunciating a biological fact. Furthermore, he is not merely the sole heir of past evolutionary progress, but the sole trustee for any that may be achieved in the future". From the evolutionary point of view, the destiny of man may be summed up very simply: "it is to realize the maximum progress in the minimum time. That is why the philosophy of Unesco must have an evolutionary background, and why the concept of progress cannot but occupy a central position in that philosophy" (23).

As part of this evolutionary progress, Unesco was to represent the highest civilisation, progressing through the advancement of knowledge and international understanding. As such it also stood above and beyond local ideologies. The evolutionary principle implies that nationalism must give way to internationalism, the concept of many national sovereignties to "one world sovereignty" (24). For this to be realised it is not enough with the dissemination of unifying ideas across national boundaries, but one also needs political unification, "whether through a single world government or otherwise, as the only means of avoiding war". World political unity, he admits, is a remote ideal, and it falls outside Unesco's field of competence. Nevertheless Unesco can do a great deal to lay the foundations on which such unity can later be built. It was to be a vehicle to transcend the limits of nationalism and foster an internationalist spirit based on the ideas of equality, democracy and dignity of the human individual.

At the same time he says that Unesco should support programs which may help in "seeing to it that power does not fall into the hands of those who should not possess it – the lovers of power for its own sake, the megalomaniacs, the overambitious careerists, the sadists, the insensitive coarse-fibred apostles of success at any price" (25). Such statements were not popular, neither amongst the representatives of governments, nor other high power politicians. The same can be said of his plan to empower scientists with their own autonomous organisation, bearing a mandate to check on and monitor politicians the world over (26).

In building up the Organisation, Huxley ignored nation-states, co-opted strong-minded individuals, and originated "NGO legions to aid his organisation in 'advancing on a broad front'" (27). His elitist concept is reminiscent of that of the sociologist Mannheim's idea of a "free floating intelligentsia". Thus he says, "to my mind, the best method for securing any immediate advance in this direction, is for UNESCO courageously to delegate an important part of its work to private individuals, chosen not as official delegates of government but as leaders of civilisation – outstanding artists, writers, men of science owing their best allegiance not to nations, but departments of the human mind" (28).

Against Huxley's wilder conceptions the second Director General, the Mexican diplomat and idealist Torres Bodet came to counterpose a more pragmatic conception

of Unesco, in an effort to strengthen its intergovernmental character. Bodet remained until the end of 1952 (29). His emphasis was on "the machinery of the state" as the bridge between the individual man and humanity as a whole. This, he maintained, did not clash with the national sovereignty principle, since intellectual unity and moral solidarity could not be achieved by an elite over the heads of nations. It required the will and cooperation of peoples and governments (30). Even if he was less interested in science, Torres Bodet worked to obtain a concentration of Unesco's energies, guided by the following three tenets: (1) the organisation of intellectual cooperation between specialists and experts; (2) the employment of every opportunity afforded by science and learning to enable all human beings to contribute to the progress of mankind and share in its benefits; and (3) the contributions of various branches of intellectual activity to international understanding.

Science: from the Centre to the Periphery

Science in Unesco was at first put under the direction of Joseph Needham. At his suggestion an agreement was immediately made with ICSU. This provided the means for quickly putting roots down into a world scientific community whose past links had been severed during the war. In return, ICSU was provided with material support, and of course a useful window onto intergovernmental affairs. The Unesco-ICSU relationship became a halfway house between the concerns of government and the interests of scientists, chief among which was to guard their own independence and win universal recognition of special rights as professionals (31). It also provided the basis for Unesco's main strategy for stimulating research in high priority areas where government action could make a difference, for example, hydrology, marine biology, oceanography, science teaching, multi-country data collection, and the extension, later, of S&T services to developing countries.

Special UN laboratories were also considered, but such facilities were costly to maintain with up-to-date in-house capabilities, and even then there was a risk of duplicating efforts elsewhere. Thus Unesco early on elected to emphasize a farming out of tasks, working through existing structures of the world scientific community and help create new ones at the non-governmental level.

To assist developing countries a social innovation from wartime practices was turned to advantage. This was the formation of co-operative networks. Major Allied powers had exchanged scientific offices and missions to promote their military research and help transcend the classical disciplinary structures that had always dominated international interchange in the past. Within Unesco this became the basis for regional offices for S&T still operating in Cairo (founded 1947), New Delhi (1948), Montevideo (1949), Djakarta (1951) and Nairobi (1965) (32). At first they were called "Field Science Co-operative Offices", to link national institutions into regional networks, whereby Unesco could stay closely in touch with universities, local scientific organisations, government agencies and individual scientists. The name is indicative of its immediate origins with Joseph Needham who had brought with him his experience of setting up scientific extension service units in Asia during his wartime function as Director of the Sino-British Co-operative Office in China. Already in 1943, in line with his Marxist oriented

socially responsibilist ideal of science, he had proposed a World Science Co-operation Service. Now science was to be enlisted in the fight against post-war ignorance, poverty and disease. It was to be given an immediate enlightenment and welfare function.

At the first meeting of Unesco's sub-commission on science, Needham said he was delighted to see gathered people who never before in the history of science had gotten together (33). Referring to his own experience in China during the war he spoke of the deadening and even demoralising effect produced by the isolation in which certain scientists have to live. "Remote districts lack the help which could normally be given scientists. In certain countries there are barriers of caste, tradition, or customs, between the different branches of science". He also noted how "in remote regions scientists owing to their small numbers lack the stimulus of mutual discussion", and remarked on the negative effect of "the lack of understanding by local officials" (34). Distinguishing an enlightened or "bright" zone of the world concentrated in the metropolitan countries, Needham pleaded that it was the duty of scientists there to help colleagues in the "dark" zones in their struggle against isolation, for more equal distribution of natural resources and manufacturing goods as well as medical products across the world (35). A Brazilian delegate, Ozario de Almeida, picked up the metaphor, and playing upon Needham's notion of the ecumenical nature of science, he maintained: "In the world today... Unesco's main function is to spread the 'bright zones' and enlighten the 'dark zones'", adding that there was an important historical problem here. Some countries that once had excellent scientists in earlier times have fallen back into the "dark zone"; why is this? To answer this Unesco should extend support to the study of the history of science, including such aspects as the role of nationalism. "These questions are rather delicate, but we must take them into account. A sort of 'scientific imperialism' is practiced by countries which only believe in what has been done in their own country, and sometimes despise work done elsewhere" (36).

In a memo that was circulated in various versions since the summer of 1944 Needham outlined his own critique of what he called the "*laisser-faire*" theory of international relations in science. According to this theory contacts ought to be allowed to develop spontaneously on an internal science-driven basis, without intervention from outside. This is all very well, Needham noted, if everyone in science knows everyone else, but this is not the case any longer. A Polish scientist wishing to know something about the frequency of occurrence of a certain gene amongst, say, the Chinese, or the Indian population in Peru, for the most part will not have friends in China or Peru who might be contacted through the ordinary mail. Here Unesco could fulfill an important function, as a platform and clearing house for transnational intercourse. Most important therefore is what Needham called the "periphery principle", the one of extending the bright zones of science from the metropolis to the peripheral countries. This principle is to be complemented by one of minimal or non-interference (autonomy) in the bright zones themselves.

"The fundamental error of believers in '*laisser-faire*'... is that they look at the scene too exclusively from the Euro-American point of view, that is to say, they think of oscillating between Paris, Brussels, London, New York, Washington, Montréal, and the like. They do not realise that the picture of world science looks very different when

seen from Roumania, Peru, Java, Siam or China. For historical reasons, since modern science grew up in Western Europe, there is a 'bright zone' covering Western Europe and North America, where all the sciences are very advanced and industrialisation is highly developed. It is particularly the scientists and technologists in the far larger regions of the world outside the 'bright zone' who need the helping hand of international science" (37).

The *laisser-faire* theory also tended to reinforce old boy networks in science. In a comment on Needham's memorandum, which, together with the Cannon-Field Memorandum on ICSU drafted at Harvard, seems to have been widely discussed in certain circles of leading scientists, Richard Field observes how the chief value of the report lay not so much in its model for incorporating science into Unesco, as in its ethos. The real problem as always was not organisational forms or guidelines, but the "tendency, quite naturally, to honor a man because of his distinction rather than to select a man because he is the one on whom you would like to rely in a crisis like the present one" (38). Thus, says Field, "except in Needham's and our Memorandum, I seem to sense altogether too much expression of the self-importance of scientists rather than a clinical discussion of the scientists' responsibilities to the ills of civilization" (39).

In his memo Needham recognised the importance of scientific NGOs like ICSU, but found that these international agencies in war-time had gone into "a state of suspended animation". Before the war, by contrast, they had been handicapped by the lack of sufficient funding and adequate secretarial services. The war however did what peace-time could not. It stimulated the emergence of scientific and technical liaison offices in the major capitals, organisations "in general much more efficiently run than anything known to international science in peace-time" (40). With the exception of Needham's own British Scientific Mission to Chungking, these offices for the most part dealt with science relating to the war effort. "These science cooperation offices differ from pre-war international scientific cooperation mainly in that they have adequate funds, secretariat and mechanical aids; and are not confined to any one science, but have a *carte blanche* to do anything which may assist in better scientific cooperation between the countries which they link. They are therefore rather a new departure, pointing the way for the future... what we need today is fundamentally an attempt to combine the methods which science has spontaneously worked out for itself in terms of peace, with those which the nations have had to work out under stress of war" (41). It was not autonomous science, but science in the service of social demands, particularly warfare, that spawned new institutional arrangements of importance to science and society.

In his Boyle lecture at Oxford in 1948 Needham observed that it was fortunate that through Unesco science was linked to culture and education. "There were those at that time, however, who thought that it might be much better to have a specialized agency of UN purely for science and technology; if that had happened the subsequent developments would have been rather different. The ties with education and cultural subjects would have been weaker, and there would perhaps have been stronger ties with industry; this would no doubt have had its own advantages and disadvantages. In any case, the course of events did not render it a practical proposition" (42). One of the

major concerns at this time was the development and use of the atomic bomb in warfare. This was an area that, in the words of Esther Brunauer in a US State department study on ICSU 1945, "has drawn attention to the international aspects of fundamental scientific research and has provoked wide-spread discussion about controlling the application of scientific knowledge so as to serve the general welfare and avert disaster to mankind" (43). The atomic bomb accentuated an interest in international scientific collaboration. Here the tension between science-driven interests and governments' efforts to curb and control free exchange of ideas, the contradictory agendas of internationalism and several nationalisms, was to become most obvious.

The innate contradiction between elitism and broader popular action within Unesco thus manifested itself in many different ways, frequently overlaid by a complexity of geopolitical factors. With respect to Needham's periphery principle, as time went on, the Americans began to emphasise aid to underdeveloped countries for fear that, failing this, the USSR would gain a greater influence amongst them. The Europeans for their part were more inclined to foster intellectual cooperation, and they felt that undue emphasis on development aid to the former colonial world meant less funds for their own priorities. Intellectual co-operation, moreover was a non-partisan activity, while aid to Member States was political in character. A debate on subsidies to scientific NGO's revealed further differences of opinion. Some felt that general funds to ICSU and its organisations did not fit in with Unesco's purpose, to work for peace. Scientists would just take these funds and use them to advance their own internalist interests, ignoring the extra-scientific dimension. Others argued that support to natural science through Unesco was an indirect form of support to the cause of peace, since science is international and intellectual co-operation as such contributes to international understanding. Many scientists moreover have leading positions in their own countries and this could exert a salutary influence on foreign policies to bring them closer to the cause of peace (44).

Needham did not share Huxley's optimism concerning the virtues of scientism – in the 1930s he had called it the "science opium" (45). He was sceptical of elitism in all its forms, and certainly wanted to avoid what he called the "mandarism" of the former IICI, because its aims were "too vague, academic and contemplative" (46). Needham was unusual amongst leftists in that he was both a Christian and a Marxist by heart. His vision was one of an action-oriented network of "free-floating scientific missionaries" (47). Within Unesco he had a chance to try and translate this vision into reality, to use the Organisation's active presence in different parts of the world to broaden the scope – in practice – of the universalist principle which was supposed to form the core of scientific internationalism.

In principle one could conceive of a scientific internationalism that is based on a free sharing of resources and facilities. An example might be an international research facility under the banner of the UN or ICSU, where scientists from rich and poor countries alike may collaborate regardless of what share in the investment and upkeep of the facility is made by their own particular country. Such an idea, materialised for example in the setting up of truly international research stations on Antarctica would provide have-not nations with access to an object of research that is unique and ordinarily out of reach.

Such ideas when they are proposed, however, are often motivated by the self interest of the advocate country to obtain some form of cost sharing. On the other hand there are obviously many practical difficulties owing to differences in political organisation, language barriers, as well as cultural and intellectual traditions, and these are used to argue against the efficacy of such arrangements. This has been most evident in Antarctica recently where the political regime, with an intergovernmental treaty organisation provides unique preconditions; but even here collaboration is limited to bi- and multilateral arrangements, in some cases limited to logistics (48). In principle this is only a repeat of what happened when Unesco sought to catalyse far reaching intergovernmental collaboration in the sphere of nuclear power.

Immediately after the war European scientists chafed at their exclusion from research facilities and findings due to the veils of military and commercial secrecy that surrounded much of post-war science. Some of them had contributed to lines of research earlier, which were now closed to them because of their political affiliations. To counter this the British mathematician and Bernalist, Levy Hyman suggested a network of international research institutions, located in many states, open to researchers of all nations. Henri Laugier, former head of the CNRS and another Leftist from France, who was in exile in Montréal, Canada, during the war proposed that such laboratories should fly the flag of the United Nations. Joseph Needham and other Unesco scientists carried this idea as far as financial and political support would allow. When the idea came up again in 1949, Pierre Auger took hold of it and succeeded in at least embedding it in a decision-making process in the European arena, where it became a European project; CERN was its most important outcome (49). Established in 1952 CERN involved 14 European states.

The idea of international research institutions under the auspices of the United Nations has come up time and again, but the really far reaching realization of it in the sense proposed by Levy Hyman and Henri Laugier has never been achieved. One of the most original initiatives on the institution-building front coming close to the ideal was the creation of the International Centre for Theoretical Physics, now located at Miramare near Trieste on the Adriatic Sea. It is the outcome of cooperation between the Italian government, the IAEA and Unesco. Starting up under its founder and Director, Abdus Salam, by 1978 it housed some 100 scientists, and received about 1300 visitors per year, representing 93 countries over the whole period, with 80 of them being from developing countries (50). This has helped Third World scientists stay in touch with an important research front and curbed brain drain in some small measure. Another tactic has been to get institutions in a given country to take on an international lead function, as in the case of the International Soils Museum in the Netherlands (sponsored by FAO and Unesco). In such cases the involvement of the host country's government is an important element for success.

In 1948 Needham was succeeded by Pierre Auger, a French physicist with leftist leanings, who moved from the Executive Board to the Secretariat. Auger had been in Montréal during the war, working with the Canadians on an early nuclear research program. As a member of the French delegation at Unesco's first General Conference he presented a view of science that emphasized information exchange, aid and post-

war reconstruction. Information was needed to break the isolation between scientists which had been aggravated by the war. It was also needed as an essential part of the science advisory machinery that was gradually being put into place by post-war governments.

Later, in 1950, Auger countered what he saw to be a harmful pessimism evoked by people like Einstein and Bohr. In their critique of atomic science these men, Auger felt, helped fan the flames of an anti-science movement which had been latent in circles of non-scientists. "Much as I respect and appreciate the arts and literature, I cannot admit that those forms of man's intellectual activity display the same characteristics /as science/; so much talent and effort have been wasted in producing works which have proved ephemeral, either because the material was perishable, as with Greek painting or simply because fashions have changed and we no longer find pleasure in their contemplation" (51). In science it is different - here the effort is cumulative, and progress abounds. Auger predicted that three hundred years hence the twentieth century will be seen as "the scientific age"; it will be remembered much more for its scientific achievements than any political (or for that matter artistic) event.

Like C.P. Snow about the same time, Auger argued the superiority of science over the other culture, arts and humanities (52). Like Huxley, he pleaded for a new humanism based on consciousness of evolution, a humanism scientific at its core. "In the face of his own success, in the face of his own machines which have become magic slaves, man is afraid, and fear is a poor adviser... Is it not now time to re-establish a harmony, a unity in this man's divided soul? For this, must we not lay the foundation of a new humanism, a humanism that would be total – including science – and would take the place of classical humanism which was also total in its time?" (53). The answer was given. The scientific culture should be embraced by everyone as a guide for the future.

In the late 1950s Auger was commissioned to do a study of "current trends" in scientific research. This was to be one of the earliest research foresight reports (54).

The science-humanities – or "two cultures" – cleavage had already been institutionalised in Unesco, as philosophy and the social sciences were placed under culture, while the human sciences were affiliated with science. This split which occurred in 1946 was a victory for the functionalisation of the social sciences. Opposing a suggestion to wait a few years before institutionalising this dichotomy, Huxley stated: "To sum up, what we are doing is, for purely administrative and practical reasons and to satisfy the requirements of administrative logic, to separate the social sciences section from part of the section on human philosophy" (55). Therewith he had given a functionalist pragmatic defense of the cleavage that was part of the post World War II strategy of fostering the natural sciences for their instrumental rather than their cultural value.

Nuclear Energy – a Failed Attempt at Equal Exhange

As already indicated, peaceful uses of atomic energy was one of the most prominent issues discussed in the post-war era. Parallel to Unesco a United Nations Atomic Energy Commission was set up in hopes of developing global management of this important resource, pooling information and experience for peaceful purposes, and exercising controls which would curb a proliferation of atomic power for military purposes (56).

Unfortunately the UNAEC was unable to fulfill its mission, and in 1949 the agency was declared defunct. Not long after there were discussions regarding atomic collaboration for peaceful purposes and research under the auspices of Unesco. This was perceived by the British as a clever move by the French to broaden their nuclear involvement by going European. The following statement by a British physicist is indicative of British suspicion of French motives in this regard: "As far as I can see the whole plan /CERN/ is just one of the high-flown and crazy ideas which emanate from UNESCO... if the French want to have nuclear physics research laboratory why don't they go ahead with the co-operation of any country interested... (57)". A Unesco affiliation was in some scientific circles apparently perceived as rather suspect, and this no doubt even more so in the field of atomic energy. Another factor counting against Unesco was US interest in ensuring itself a strong controlling position. In this respect, after 1954, Unesco was no longer the essentially "Western organisation" (see above) it had been until then.

Auger was instrumental in the events that led up to the creation of CERN (European Organisation for Nuclear Research) based just outside Geneva, a laboratory established in 1954 essentially devoted to doing basic research in high-energy physics. Today CERN has a staff of about 3,500 people and its facilities are used by a large number of outside visitors, including from non-Member states, such as the United States, Japan, the former Soviet Union, eastern and central European countries and China. CERN's central funding today is thanks to allocations provided by fourteen European governments who share the burden roughly in proportion to their Gross National Products. CERN's annual budget is presently in the order of $500 U.S.

Much has been written about the history of CERN, so we can be brief here (58). For our purposes it will be sufficient to point to a number of general factors that indicate how science, especially Big Science, when it becomes subject to transnational cooperation, assumes an important political dimension. In some ways science for each of the nations involved becomes in part the continuation of politics by other means; in this case it was a question of an early form of Europolitics, both vis a vis the United States, and internally between the nations involved in building up CERN. Originally the idea was to open up a space for research in nuclear physics in the face of a lack of material resources, which hindered scientists in many countries from going into research on the structure of the atom. In addition there was the Atomic Curtain, the conspiratorial closing of laboratories in East and West, in the Soviet Union and the United States during the Cold War. The preliminary plan for a European nuclear research centre was developed by the Unesco Secretariat. Even though the outcome was not a universal international facility, the idea was picked up and translated into a regional European initiative which helped to somewhat redress the balance of power in physics vis a vis monopolisation by the two superpowers.

Stemming from Eisenhower's speech on atoms for peace in the United Nations in December 1953, there was another line of development, leading to the creation in 1957 of a new organ within the UN structure, the International Atomic Energy Agency (IAEA). It took over some of the functions intended for the old UNAEC. In particular it would store future contributions of countries from their stockpiles of normal uranium and fissionable materials and divert these to peaceful uses. The specific mandate included

safeguards and monitoring of fissionable material (59). It took some time to get the USSR on board, but in December 1954 a UN resolution was unanimously adopted on "international cooperation in developing and expanding the peaceful uses of atomic energy... to assist in lifting the burdens of hunger, poverty and disease" (60).

Once again Unesco found itself bypassed, despite its longstanding concern about nuclear energy at the level of basic research, and also with the question of impacts on society. In practice, Unesco's focus was limited to four areas – radioisotopes, effects of radiation on life in general, training of research personnel, and the diffusion of specialist knowledge. The second of these tasks moreover was largely farmed out to ICSU.

Within Unesco, naturally, there was considerable disappointment over this limited role. It is possible that it was the technological orientation of the new initiative that clashed with Unesco's "purer" science mandate. But this was not the only reason. Unesco's credibility was also still being questioned during this period. Laves and Thomson write that "... political and scientific leaders did not yet have enough confidence in the Organization as a channel for the exchange of scientific information and for stimulation of basic research on a highly significant problem...Unesco, in the face of an opportunity for constructive and more dramatic action was assigned a secondary role" (61).

Whatever the reason, the creation of the IAEA was interpreted as a setback for Unesco (62).

Until he left at the end of 1958, Pierre Auger continued to stimulate important new initiatives. Given his special interest and considerable experience in nuclear research, the Unesco Secretariat, not surprisingly, was keen to play an increasingly prominent role in developing peaceful uses of atomic energy – in contrast to its destructive possibilities – in industry, transport, agriculture and health. We have already noted the role played in the launching of CERN. In 1955 Unesco collaborated with the UN in the first International Conference on the Peaceful Uses of Atomic Energy held in Geneva and in 1957 it organised the first international conference on the use of radioisotopes in scientific research. Other than this, atomic information again, did not come under Unesco's principle of "free flow" of ideas. The Atomic Curtain continued, also after the dismise of the UNAEC in 1949. Unesco's bid to become the international forum for atomic energy discussions proved to be utopian for a world dominated by "realpolitik".

Environmentalism - Resource Exploitation and Protection of the Planet

During the early years nature conservation was another important theme. Here Unesco also tried to play a role as global orchestrator. As it turned out some of its first projects failed rather miserably, but later on when environmental consciousness began to develop more broadly Unesco was well placed to play a leading role.

One early project led to the foundation of the International Institute of the Hylean Amazon in Manáus, Brazil. This was the first intiative in relation to studies of the biosphere. The idea was to investigate the Amazon basin and the world's largest tropical forest. Several inter-American agencies, the Rockefellers and the governments of Britain, France, Italy and the Netherlands were interested, hoping for economic benefits from future exploitation of the region. Huxley for his part was against the project, and later

it fizzled out because of the lack of financial support and intractable political problems. In retrospect it is often referred to as an embarassing mistake.

More successful was a series of projects to study arid zones. In this case the effort was developed via the farming-out strategy through a network of non-governmental organisations, stimulated by Auger. Unesco's role was a catalytic one, sponsoring a series of symposia and meetings on, inter alia, hydrology, water supply, ecology, energy sources such as wind, solar and geothermal power. Arid zone climatology and desalinisation techniques were later topics. In ecology the distinction between human and animal ecology was introduced.

Victor Kovda, a soil scientist from the Soviet Union succeeded Auger as head of the Department of Natural Sciences from the end of 1958 until 1965 (63). Under his tenure several further intiatives were taken in the area of research relating to environmental protection, including the creation of the Intergovernmental Oceanographic Commission (IOC) which is an important actor today in contemporary research on the enhanced greenhouse effect and its possible implications for the world climate. In retrospect, one can conclude that Kovda reflected his generation's technological optimism, reinforced by his conviction that a science of science could be used to guide scientific development and manage natural resource extraction more rationally. The possibility of technological fixes to solve any negative impacts of industrial development seemed endless.

An avowed socialist, and with experience from non-governmental international organisations, Kovda's standpoint on the SRS issue closely approximated Needham's and that of the Bernalists (64). He combined a quasi-Wellsian streak of visionary scientism with a commitment to social responsibility that underscored the importance of extending scientific internationalism to all those countries that had cast off the yoke of colonialism. Infrastructural development could now be financed through the United Nations Development Programme (UNDP), which was launched by the UN General Assembly in 1959. The total funds administered by Unesco under this program between 1960 and 1970 amounted to 208 million dollars, which was an increase by a factor of ten compared to similar assistance via the Expanded Programme of Technical Assistance, a comparable program, in the previous decade (65).

To give a sense of the heady scientism that lived on in Kovda's mind and approach, let me quote the closing futuristic scenario from his review of Unesco's scientific activities at the time.

"The scientific and technological revolution is rapidly increasing man's power over nature and at the same time bringing the interests of the different continents and nations closer together. The need for international scientific co-operation will continue to grow, and there is not doubt the next thirty or forty years will witness events which will lead to profound changes affecting the whole world. In that time, most developing countries will have completed the first stage of industrialisation and agricultural reorganisation. Crop yields and the productivity of livestock, farming and fisheries will have been tripled, and the storage and distribution of foodstuffs will have been rationalised. The crisis in food supplies and the problems of hunger and protein deficiency will be overcome. The problem of water resources will also be solved: mountain glaciers and polar ice, gigantic atom-powered desalination plants, powerful, carefully sited pumping stations will provide

new reserves of pure, fresh water. The arid zones will be irrigated and reclaimed. Man will master the art of controlling the condensation of atmospheric vapours and of retaining moisture on agricultural lands. A large number of extremely deep boreholes will be sunk to explore the earth's crust, which will thus be made to yield up its secrets and provide new sources of geothermal energy and new resources of minerals. Most of the pollution of the environment will be halted. Wide use will be made of the resources of the oceans to meet the needs of man. The threat of war will be averted and social justice will triumph throughout the world. Are these Utopian dreams? No, this is a realistic projection and development of the process on which man has embarked in the twentieth century; scientists and all who believe in progress should fight to ensure that these things come to pass" (66). Contrasted with some of the pessimism and anti-science trends that were taking root at the time, Kovda's vision is a worthy continuation of Huxley's evolutionism, here translated into the idiom of the dialectical materialist theory of STR, the Scientific and Technological Revolution.

In this spirit the science sector was involved in the planning of the UN Conference on Science and Technology for Development for the Benefit of Less Developed Areas (UNCSAT) in 1963. This in turn became a vitamin injection for Unesco's own science component, with a 50% increase, that year's budget for the Science Division. Following it science was formally accorded the same status as education. Arid zone research and the study of methods for their reclamation continued, while hydrology and fresh-water resources were given greater visibility. Seismology and the monitoring of earthquake-prone areas was also developed. On the more basic science side, Unesco funds indirectly helped support the planning of the International Geophysical Year (IGY 1957/58), where oceanography, the Antarctic, developments in rocketry and satellites, and therewith atmospheric research became important topics to be followed up. In the marine sciences in particular ICSU-Unesco cooperation served to fill an important gap (67). The Intergovernmental Oceanographic Commission established in 1961 involving about fifty countries, was placed directly under Unesco, with an Office within Unesco to act as secretariat.

The strategy of working through ICSU brought with it a strong drift towards basic research. This reflected the interests of the industrially advanced countries. In the post-war era international cooperation necessarily carried much further than the classic modes of exchange of data, international congresses, symposia, etc. Now it increasingly included much more wide-ranging planning, organisation and carrying out of complex research projects, experimental development, data-gathering, inventory of natural resources and analysis of results. This trend was driven by several factors. Theoretically there was the development of applied mathematics, operational analysis, cybernetics and systems theory. The 'cybernetic episteme' made its entry in several fields where a systemic approach helped bring together strands of mutually isolated disciplinary research in comprehensive interdisciplinary efforts. At the practical level this was complemented by the need to share the costs of increasingly expensive R&D. Furthermore there was the need to extend worldwide the scientific study of large systems on the globe – in such fields as meteorology, hydrology, oceanography, and the biosphere.

Here Unesco proved to be an important forum for gaining the support of governments for research that was transnational and problem-oriented in its approach.

The same may be said for the need to preserve human life and its quality, an issue that was on the rise, prompting new approaches in ecological studies relating to the protection, conservation and improvement of the environment, pollution control and medicine. In addition there was the need to develop international legislation in new areas of endeavour, like ocean resources.

When the International Hydrological Decade (IHD) was declared in 1965, it brought together more than one hundred countries doing research; and six years later the "Man and the Biosphere" program (MAB) was instituted, prompted by the growing environmental concerns of that time. A *Soil Map of the World* (scale 1:5,000,000) was completed in the following year. Before that much of the work on the biosphere was done through ICSU-Unesco collaboration within the framework of the International Biological Programme (IBP 1964-1974) entitled "The Biological Basis of Productivity and Human Welfare" (68).

A concerted prong of Unesco's strategy during this period concerned strategic basic research aimed at a better understanding of the biosphere and the earth's crust. It was in the wake of a joint UN-FAO-WHO conference on the biosphere, in 1968, with members of the Unesco Secretariat in attendance that governments decided to let Unesco and other interested agencies chart a long-term international and interdisciplinary plan, MAB which was to later influence the theme of the UN Conference on the Human Environment in Stockholm in 1972. As Michel Batisse of Unesco saw it, the question raised was, "can we keep the planet habitable" (69).

When the IBP was dissolved in 1974, its research tasks were absorbed into the MAB, which was broader in its approach and put more emphasis on conservation as distinct from only exploitation of the biosphere. The attention focused on biogeochemical cycles and the adoption of general systems theory and modelling with the help of computers with an eye to predicting long-term changes, which makes it a predecessor to the present day IGBP or Global Change Program. Victor Kovda already then articulated a central posit relating to the greenhouse effect. "Man is now producing so much energy and the increase of energy has been so great that the resultant effects on the heat balance, combined with the pollution of the atmosphere and oceans, could well lead to drastic changes in the earth's climate in the next fifty years" (70).

MAB involved several member organisations of the ICSU family. ICSU itself was made a permanent advisory body to Unesco with special reference to the Organisation's Natural Science Programme. This afforded a more solid basis for peer review of Unesco projects. The idea was that ICSU and Unesco complemented each other in the promotion of science and international cooperation in scientific research. ICSU's leadership for its part was not always satisfied with this relationship. In as far as Unesco projects tended to be policy-driven, advice based on internalist quality control criteria might go unheeded (71).

In the geosciences the concept of plate tectonics triggered a revolution bringing together many disciplines. In this case Unesco supported the study of the solid earth,

in particular the upper mantle through the Upper Mantle Programme (UMP), and later studies of the Lithosphere.

Opening up More Widely to the Third World

The Unesco-ICSU partnership helped push the focus on internationalism in science from discipline-driven to policy-driven research. At the same time this tended to perpetuate an industrial country bias which now came under criticism. Consequently, in the wake of the UNCSAT meeting more attention was also devoted to furthering another prong of Unesco's strategy, meant to benefit Third World countries. 1964 marked the beginning of an "operational phase" corresponding to a growing awareness in this direction, even on the part of working scientists. The stronger emphasis on development however brought with it a controversial element, in that internalist criteria for quality control in science tend to be relaxed as externalist criteria of social relevance become more prominent. So too in ICSU, and in Unesco the interest of the industrially advanced countries therewith began to flag, while Eastern European and Third World participation intensified.

This particular prong of Unesco-strategy included, among other things, the extension of scientific services and standards to the Third World, and ICSU was particularly asked to pay more attention to recruiting scientists from developing countries to its various associations. Special efforts were made to assist these countries with metrology (the science of measurement), standards and scientific instrumentation (72). Developing countries also had an interest in modern methods of making inventories of natural resources, topography, geological surveys, etc. A further area was infrastructural support in science information, taken up under the auspices of the UNISIST program from 1972 onwards It introduced a concept of systematic information in policy-making to developing countries, to facilitate among other things, comparisons between operational information systems at national and international levels.

In 1965 a system with regional ministerial conferences on S&T began to promote science policy analysis and planning: Latin America 1965, Asia 1968, Europe and North America 1970, Africa 1974, Arab States 1976 and (Eastern) Europe 1978. This was a reflection both of the interests of new Member States, and the general trend in science policy in many countries at that time, also in the Western industrial nations. Between 1965 and 1977, altogether 67 countries set up or strengthened planning and policy machineries as a consequence of Unesco missions, and some 130 reports were issued (73).

Unesco was indeed eminently placed to do science policy research, and in the 1960s it developed a unit to this end. However, despite the high calibre of those involved, the output was rather limited in quality. There was a lack of integration of S&T into development planning, and a strong tendency to imitate (albeit with a certain lag) the changes of doctrine in the industrially advanced countries (74). Steven and Hillary Rose wrote in 1971 that, "the country-by-country documents on science policy that UNESCO has issued over the past few years, which could serve a most useful comparative function, are emasculated because no word of criticism or analysis can appear, for the document is compiled by the government itself, and, before an international audience,

nation states are conspicuously lacking in self-criticism. Inevitably such documents are not only anodyne but also virtually unreadable" (75).

Science policy is a relatively more controversial subject than science *per se*, and here the process of dilution to a common denominator of generalities built into the intergovernmental structure did its job. Even surveys and studies where the science policy unit orchestrated sociologists and other professionals on contract tended to be rather uncritical. This may be seen in the International Comparative Study on the Organisation and Performance of Research Units (ICSOPRU), a program initiated in 1971 to assist in improving the management of R&D in countries that elected to participate. In its initial phase this important innovation helped disseminate experience in making inventories of scientific performance for purposes of management and planning. However, as time went on, new insights were gained with respect to the contextual nature of the sociocultural preconditions for scientific knowledge production. These emerged internationally in the new sociology of science, but they were not taken into account by the ICSOPRU project. Rather it continued its original rather positivistic mode inspired by systems theory and a scientistic view of the interface between science and society.

ICSOPRU involved data collection on various parameters relating to research groups (size, organisation, leadership, publication and patent output counts, etc.) in different institutional settings in various countries on the basis of a set of detailed questionnaires. Between 1973 and 1986, seventeen countries were reviewed in four successive rounds, with seven countries in the first round, six in the second, five in the third and four in a fourth round. From the outset the program assumed a positivistic decontextualised approach to studying research groups. Therewith the object of comparing performance indicators across national and cultural boundaries was fundamentally flawed; significant differences in externalist factors, and changes in these over time in any given country were essentially ignored.

At the outset it was mainly Western European countries and two Eastern European ones that participated (76). In the second round it was only Eastern European and some Third World countries. By the third and fourth rounds Third World countries predominated. Furthermore by 1986, interest and the main legitimation of the exercise had also shifted from R&D managerial aspects and policy arguments to the desire of Third World countries to obtain computer software and learn computerised aided survey techniques (77).

An evaluation made in 1988 concluded that, "in its nearly 20 years of operation it /ICSOPRU/ has provided little, if any, input to policy-making, while reproducing frameworks of social analysis that fail to address the special problems of developing countries" (78). The gradual shift in the profile of countries participating in the ICSOPRU exercise is significant in that it reflects the more general tendency in post-1954 Unesco; Western industrialised countries were becoming less interested while countries in Eastern Europe and the Third World were the ones that found most practical use for their affiliation.

A study of sales of Unesco publications for 1968 indicated greater attentiveness to Unesco activities in Latin America than in North America, and the most sizable readership in Europe, including the USSR (79). With the appointment of Amadou Mahtar M'Bow

as Director General in 1974 a new period began, characterised by further accentuation of Third World attention and a continued slackening of interest on the part of a number of states in the West. This shift from the metropolis, implying a more thorough opening up to the Third World, followed changes in the numerical pattern of membership.

Between 1954 and 1974 the number of Unesco Member States almost doubled, from around 70 to almost 130. A major portion of the increase is accounted for by the decolonialisation process. In the same period the number of NGOs affiliated with Unesco increased from around 120 to just over 300.

The influx first of Eastern European countries in the 1950s and then successive waves of newly independent Third World countries, brought with it overtly partisan support of issues like the introduction of a New World Information and Communication Order (NWICO), fundamentally challenging Western hegemony over the realms of culture and new technologies for dissemination of information and cultural products, as well as in some other areas of endeavour. This shift in ideology, precipitated by the mounting influence of a new majority, actually prompted British and US withdrawal from Unesco in the mid-1980s. It also spurred intensive media attacks on Unesco and its DG, Amadou Mahtar M'Bow from Senegal (appointed in 1974). M'Bow was replaced in 1987 by the – for the West – more amenable Frederico Mayor from Spain. The US and UK withdrawals, aimed at crippling the Organisation and bringing it to its knees, involved contractions of Unesco's budget by one third.

It would go beyond the scope of this chapter to give a detailed account of salient events in Unesco during this period. Suffice it to mention two episodes that indicate the flavour of the ideological conflicts. They should be of particular interest to students of scientific controversies - controversy studies being a recognised branch of the more general field of science studies (80). One relates to Unesco's critique of Israel and archeological diggings in East Jerusalem which were seen as part of a policy to deface cultural monuments that are an important part of the history of the Palestinian people. The other concerns the question of mass media and communications technologies, culminating in the controversial MacBride report, published by Unesco in book form, under the title *Many Voices, One World* (1980).

In the years 1974-76 Unesco suddenly gained notoriety due to open criticism of Israel and Zionism, the latter being equated with racism. In one resolution Israeli occupation was condemned for its adverse affects on Palestinian rights in the spheres of education and culture, and a demand was made for the Director General to monitor the situation. A second resolution criticized Israeli archeological excavations in East Jerusalem as altering the historical and cultural nature of occupied territory, and called for the Director General to withold assistance from Israel until it complied with earlier Unesco resolutions on the subject. A third resolution blocked Israel's bid to become technically affiliated with "Europe" as a budgetary category of regional activities (81). This precipitated a crisis in Unesco-Israeli relations, and the international press latched onto it, portraying Unesco as the handmaiden of extremism which was now driving Israel out of its fold. The question of archeological excavations is still very much at the heart of the cultural struggle in the interpretation of the Syro-Palestinian heritage and even the early role of the Phoenicians in West Asia.

The Non-Aligned countries' challenge to global power relations led to a call for a New World Information and Communication Order (NWICO), which won backing by a majority of Unesco's membership by 1976. A Media Declaration in 1978, the result of a Soviet minority bloc initiative, and for this reason easy to discredit, was followed by a report commissioned by the Director General, M'Bow (82). The panel that drafted this report consisted of sixteen eminent persons, headed by Sean MacBride; on balance it reflected Non-Aligned views (83). An interim version of this report evoked heated protests from USA and some other Western countries, not least on the need for an international right of reply and for protection of journalists. The question of formulating principles governing use of communications satellites, and that of distributing more equitably such limited natural resources as the electromagnetic frequency spectrum and geostationary orbits, where major powers had a monopoly, were also addressed. A call was made to redress the unjust skew in global communication capabilities, to increase the accountability of controllers of the media, to democratise communication, and to move towards a NWICO. Finally, the old doctrine of "free flow", codified in Unesco's Constitution was criticised. The MacBride Commission found that, however generous an aspiration, this doctrine had in practice served the purposes of a few vested interests, nationally and internationally.

The final report was toned down considerably, a number of proposals, like the one on the rights of journalists were cut back, and its normative character was watered down, turning it into more of a descriptive document. Even then M'Bow steered clear of submitting it to the GC. Instead, in his capacity as DG he presented an account of the findings, and a resolution was adopted in which it was pronounced to be a "valuable contribution" to the NWICO-discussion (84). In practice this amounted to a pat on the back together with a diplomatic shelving. This has not hindered the MacBride report from becoming a much cited work that lends itself to mobilisation in more critical analyses, even today, as in Edward W. Said's book, *Culture and Imperialism* (1993) (85). Unesco has helped drive home the point that the new media penetrate more deeply into a "receiving" culture than any previous manifestations of Western technology, producing serious social contradictions in developing countries. "Even not entirely sympathetic writers like Anthony Smith in *The Geopolitics of Information* concede the seriousness of the issue, that in the late 20th century the new electronics was a greater threat to independence than was colonialism itself" (86).

Here is an example where Unesco as an intergovernmental organisation has been able to put greater authority behind the impact on public opinion of certain findings than what might have been the case for a non-governmental organisation.

More recently the theme of cultural imperialism has been degutted of its overt political idiom to be turned into a non-committal discourse about "globalisation". The key term of globalisation theory in cultural studies now is taken once again more "neutrally" to refer to both "the compression of the world and the intensification of consciousness of the world as a whole" (87).

Concluding Remarks

It has been remarked that Unesco's Constitution, adopted 16 November 1945, was the last great manifesto of eighteenth century Enlightenment. It was a utopian document reflecting a "fervid belief in the bases of the liberal democracies that had just triumphed over fascism and pinning hopes on reform through education, science and reason" (88). The idea of science and internationalism as vehicles of order and justice reflected a particular brand of Western liberalism articulated by intellectuals in Anglo-Saxon speech communities. "Anglo-Saxon preferences for problem orientation and pragmatism won out against the French leaning toward broadly cultural approaches" (89). In the social sciences, in addition, the quantifiable approach of the US, Britain, Scandinavian and Dutch countries won over the "synthesising and moralizing Latin tradition".

The content of what was disseminated under the rubric of science could be considered neutral only as long as one assumed the superiority and universality of Western scientism as a yardstick whereby all other forms of intellectual life and knowledge should be measured. This instrumentalist view was reinforced when the Soviet Union joined Unesco. The intergovernmental mode had definitely won out over the non-governmental mode of interaction. The formation of the Pugwash movement soon afterwards was an important compensation, keeping open significant spontaneous interaction between scientists from East and West. The same can be said for certain non governmental initiatives under the auspices of ICSU, as for example, the International Council for Science Policy Studies, a Commission under the International Union for the History and Philosophy of Science. Here too, Third World involvement became an important point.

During the two decades following 1954 Unesco was able to expand and stabilise itself as an international civil service bureaucracy. In connection with its tenth anniversary, the then Director General, Luther Evans, wrote: "Unesco is definitely an intergovernmental organisation, subject to the limitations and procedures inherent in official action, but firmly based on the machinery of government inherent in our Member States, including the National Commissions" (90).

Evans has been called Unesco's "first realist" (91). The Director General who sat longest during this period was René Maheu, a French civil servant who came up through the ranks of the Organisation. He did much to give a specifically French flavour to this bureaucracy, including a hierarchisation (92). Being an excellent administrator with diplomatic acumen and a talent for orchestrating mutually dissonant voices, he was able to forge practical consensus around plans for action. He also tried to harmonise the two opposing forces which continually contended, the one emphasising intellectual cooperation, the other preferring a more popular and broad base approach rooted in material progress. As Needham had projected, it was the latter of these that proved to be the more immediately important for the developing countries (93).

By 1976 also, Unesco had established relationships with some 400 NGOs, specialist ones in various branches of knowledge on the one hand, and ones representing important sectors of public opinion on the other (94).

The foregoing factors, together with the need to sublimate ideological differences between East and West however led to a far-reaching technicisation, with pragmatic instrumentalism dominating the culture of the Organisation (95). A result of this was that Unesco documents, position papers and recommendations lost whatever critical edge they might have had earlier; they had to be watered down to the lowest common denominator of agreement amongst a larger and more ideologically heterogeneous assembly. Hilary and Steven Rose in a book on science and society in 1970 described the situation as one where "extra-scientifc geo-political pressures tend to determine, therefore, the selection of scientific personnel, while a heavily bureaucratized structure which seems to be characteristic of such international governmental organisations ensures that most activities, however worthy, proceed at an inexorably leisurely pace" (96). In their estimation, Unesco had in practice come far from the initial ideal of a highly independent and critical brains trust, a *Comité de sages* outside the influence of the complex web of intergovernmental concerns and conflicts.

During M'Bow's period as DG, apart from Western inspired allegations of incompetence, the chief criticism of Unesco was that it had become "politicised". Clare Wells has however shown how the negative image popularised by the media in fact constitutes a gross misrepresentation. What had happened can be interpreted as a process of "de-technicisation" whereby the agency in a certain sense was brought back to the original more activist spirit of its Constitution; with the difference that this time the main content and thrust was no longer one that reflected the lopsided Eurocentric and Cold War ideological bias which enveloped Unesco during the early years of its existence.

The division of labour and functionalisation of activities assumed by the United Nations after its formation had moreover contributed to a form of sectorialisation that began to be questioned. After the war, since the UN General Assembly dealt with politics the various specialised Agencies like Unesco were thought of as merely implementing policies coming from the centre. This also helped to reinforce the early mask of "neutrality" central to the "ideologies are dead" ideology, or rather, as Huxley preferred to call it, a belief-system that, as humanity progressed, was synthetically created from and founded on the scientific world view. In 1950 he termed it "our evolutionary ideology" (97). René Maheu later described what he called the "ideology of Unesco" as "a scientific rationalism deriving from both positivism and evolutionism". He also indicates that its original controversial secular edge was made more "acceptable" by draping it in a – still secular – "humanism" that made reference to the Universal Declaration of Human Rights adopted by the United Nations in 1948 (98). With the upsurge of anti-imperialism echoed in various radical social movements during and after 1968, these were the kind of tacit premises that were subject to thoroughgoing reassessment in the 1970s, in philosophical as well as political terms. With the demise of positivism and the revitalisation of hermeneutic and Marxist images of science and its social relations, the very notions of neutrality and objectivity were questioned.

During the early period Unesco had been able to present an image of itself in an "objective" and "technified" fashion as long as the designs of the leading Western powers went unchallenged inside the organisation itself. But even then, outside, this

image was challenged all the more, and attacked, especially by the Soviet bloc, where Zhadanov's doctrine of "two worlds and two camps" in 1947 was the mirror image of Truman's and George Kenan's doctrine of containment. A turning point came after the Korean war and the death of Stalin (99). In the spirit of peaceful coexistence, convergence theory associated with doctrines of a post-industrial society emerged, and a more explicit "ideologies are dead" ideology took root also outside Unesco, reinforcing the Organisation's "technicisation" process even further, at least until the mid-seventies.

In the early 1970s Unesco gradually became a forum where Third World countries were able to raise their voices to challenge US and Western domination and the way science and new technologies were used to reinforce cultural imperialism. This paralleled a general trend, promoted by China and the group of 77, in their determination to establish a New World Order in economic relations, global management of natural resources, legal codes regarding continental shelves, mineral reserves and hydrocarbons at the bottom of the oceans and, by 1980, the Antarctic continent (100). Within Unesco, science was supported as before, but now in some cases ideological differences cut into particular projects. It was not so much science and technology as such, but their embeddedness in politically distasteful operations that became the objects of attack.

The UN Conference on Science, Technology and Development (UNCSTD) held in Vienna 1979 affords a window on the articulation of a great divide between Third World countries and primarily the USA and other major powers in the West, plus Japan. Unesco was in principle well placed to become a key actor in the preparations of this Conference, and indeed there were speculations at the time that its ADG for Science might chair the proceedings. However, this was not to be. Unesco was maneuvred out into the margins, and UNCSTD was orchestrated from New York to assure control by the Western bloc, preventing a radical skew of the agenda in favor of the advocates of the New Word Order philosophy in the S&T arena. Apart from its increasingly "unreliable" ideological drift, of course the point could be made that Unesco's proper mandate was science and not technology, the latter being a major concern of UNCSTD. The outcome of the Vienna Conference moreover was disappointing for those who envisaged it as the lever for a "new scientific and techological order". Nothing of the sort materialised at the intergovernmental level; at the non-governmental level however it did encourage a "new dialogue" between S&T policy interests and those concerned with socio-economic development. It also prompted a new conceptualisation where the main priority in S&T policy in developing countries principally was seen as one of "indigenous capacity building" (101).

My aim in this chapter has been to contrast and display some of the tensions between the ideal and the political reality of intellectual cooperation relating to science in the activities of Unesco. It is found that a transnational agency like this, aiming as it does at universalism in representation, serves as a platform for tradeoffs between individual national and geopolitical bloc interests. As a forum, intergovernmental and therefore transnational in character, it at the same time has a life and logic of its own. This formal autonomy opens up a space where internationalist ideals can be expounded and through this gain an influence on public opinion, even if they are in constant contradiction with

the more pragmatic behaviour dictated by the "realpolitik" interests of Member States or associated coalitions. In Unesco's early days leading personalities in the world of science were able to use it as a platform to lend their voice to the ideal of scientific internationalism, while representatives of governments emphasized the need to leave the lofty realm of utopian dreams and get down to the brass tacks of the possible (realpolitik).

The SRS movement of the 1930s presented two socially responsibilist images of science which were counterposed to the more classical liberal ivory tower ideal. Some leading ideas from the SRS movement made their way into the Unesco Constitution, albeit in a form that bore the mark of a particular geopolitical context. Julian Huxley's, Joseph Needham's, Pierre Auger's, Victor Kovda's and other scientists' experience of the conflict between non-governmental and intergovernmental modes of operation was also important. Universalism was realised in numbers (of Member States) but not automatically by more qualitative yardsticks, not even when we count by the norms that commonly make up the so-called scientific ethos (102).

Science is supposed to be international and universal. This commonly accepted ethos is nurtured internally by epistemological and material requirements embodied in scientific practices - the standardisation of instruments, calibration of basic units, methods of measurement and consensus around preferred methodologies and concepts, as well as the division of labor across scientific groups, institutions and nations. This is especially the case today in megascience projects, and in research on the enhanced greenhouse effect.

Externally, the institutional motive for using science as a vehicle for politics contributes to situations where the rhetoric of internationalism and the presentation of knowledge claims as independent of time and place can turn out to be a promotion of its diametrical opposite (nationalism and interests rooted in local and particular agendas). Science, because it is not disembodied but very much a material force becomes a continuation of politics by other means.

This does not mean that science reduces to brute politics, pure and simple. Rather it attests to its both material instrumental and symbolic instrumental values. The appeal to its purity is used to empower the actors that do so. Material and symbolic values are cashed in on political arenas, global as well as local. In other words the credibility cycle of political decision-making stands and falls with the (internal) epistemic credibility cycle of science, based on recognition, authority and peer review processes. The latter processes have become strongly formalised and institutionalised. This may be seen in the Intergovernmental Panel on Climate Change (IPCC) created in 1988 by UNEP and the World Meteorological Organsation (WMO). IPCC seeks global consensus by combining anchorage in disciplinary depth with geographical breadth, wherewith scientific elites in the North are to guarantee the former and participation in the South the latter.

The structure for the 1995 IPCC assessment reflects the conscious efforts to effect internal and external broadening and entrenchment of the exercise, with greater attention than before to paleoclimatology, earth sciences, biotic responses to climate change and feedbacks in Working Group I on the one hand, and, on the other hand coopting of scientists from Africa, Asia and Latin America into positions of co-chairs and over-

seers of the orchestration process. Thus WG I ("Science") is co-chaired by persons from the UK and Brazil, WG II ("Impacts, Mitigation, and Adaptation") by the US and Zimbabve, and WG III ("Economics and Emission Scenarios") by Canada and South Korea (103). From available documentation it is clear that the work of WG I is the most systematically developed; therefore the whole exercise has the appearance of being science-driven because its results are used as the points of departure for the two other WGs (104). This implies that the role of Third World scientists is not to develop independent knowledge bases but to focus on national and regional impacts, information which will be worked into the prearranged format (105). Moreover, this also helps explain why there is a tendency for funding to be skewed towards training and away from actual independent research endeavours in the Third World.

IPCC reports provide comprehensive overviews of current knowledge of many different aspects of climate change. Their authoritative status derives from a procedure whereby each chapter is written by a carefully selected panel headed by a couple of lead authors. Individual authors who are reknowned experts on particular problems write bits and pieces which are crafted together into a draft which is then sent out to be screened by one or two experts in a conventional peer reviewing process before publication. The rule is that the variety of scientific work cited in the chapters should in turn be solidly anchored in peer reviewed papers found in the "world class" journals in the fields covered. The format of the report, detailing chapters and sections is decided upon by the Working Group, to which the final draft comes back for discussion and further massaging. The contents of the special Policy Makers Summary, as well as the politically important Executive Summary is finalised in the course of negotiations at the plenary sessions at which actors representing various stakeholder interests are represented.

Thus we find a repeat today of the same tensions and contradictions between non- and intergovernmental modes of internationalism in science that were very much at stake in the early formation of Unesco, when the confluence of scientism and a patronising species of neo-colonialism was superbly expressed in the writings of Julian Huxley. The interplay between science and politics may be schematically represented in terms of two interfoliated credibility cycles, one based on scientific recognition, the other on money and political power (106). There is a tradeoff between science and politics. Scientists are encouraged to engage in basic (strategic) research, since it is the results of such research that counts as hard currency in the political arena. Research framed within an environmental institutional motive, for example, has a symbolic-instrumental role in the wider political context. Thus we get two mutually reinforcing credibility cycles. For science to be able to function as the continuation of politics by other means it has to be accepted as quality science within an international scientific community. Scientific credibility is needed to underwrite political credibility (107).

Recognition is symbolic capital that gives power and prestige in the scientific arena, but it may also be cashed in on the political stage, in the struggle for fundability and in the context of advice to decision-making outside science. The stronger the purity and universality with which knowledge claims can be presented the stronger the exchange rate at which the currency of science can be pinned. Contrariwise, results that are

controversial, contended or lack the backing of substantial fractions of relevant scientific communities will have a lower value as currency in political decision making. High level authority of knowledge claims in the internal cycle of scientific recognition, together with broad consensus in the scientific community will give high political legitimacy in the extra-scientific credibility cycle, and vice versa for low level establishment of knowledge claims, controversy and low consensus on science. The latter is countered by trying to broaden and deepen the anchorage of knowledge claims, internally, and therewith externally.

For the power of purity to work it is important for both scientists and politicians to maintain clearcut socially constructed lines of demarcation between themselves and their respective realms of responsibility. Ideally these delimitations should appear as though they were natural and unquestionable boundaries. In addition, functional task differentiation carries through into the scientific realm in the recognition of distinct specialities which carry special weight. Only certain scientific practitioners count as reliable speakers or privileged voices with regard to specific aspects of the problems under consideration. In its normative mode, as assumed by self acclaimed transcendent scientists, the model stipulates that scientific deliberations should occur prior to and seperate (preferably institutionally immunised from) the political deliberations into which its results will feed.

It is readily seen how the consultation process on global warming launched by the IPCC is patterned on the ideal typical in the foregoing scheme meant to represent the science-politics interface. This is verified by the views of several reknowned scientists involved in the process. The preferred language of science is that of a universalising discourse, which carries over into the political arena in the carefully managed distinction between what is known with confidence, what is subject to discussion, and what is still regarded as highly uncertain. In order to stabilise knowledge claims it is advantageous if these can be presented in decontextualised and disembodied terms. This goes some way in explaining why quantification, numerical analysis and computer modelling, as in the case of the GCMs play such a central role in greenhouse research. Furthermore, it is an important factor behind the current division of labour between First and Third World scientists.

NOTES

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1) Landström Catharina "Internationalism Between Two Wars". In Landström C. and Ezinga A. (eds.) *Modes of Internationalism in Science.* Report # 9 in the project, Science, Technology, Ideology, Culture (STIC) Department of Theory of Science, University of Gothenburg, forthcoming 1995.
2) A third point of anchorage might have been the International Bureau of Education in Geneva, where Jean Piaget was active, but this was kept out by French maneuvering. A further source of ideas was the London International assembly founded in 1941 as a non-governmental organisation "to serve the common cause of all nations resisting aggression". It had a project on intellectual cooperation, leading to a report written by Gwilym Davies, *United Nations Permanent International Organization for Education.* Davies was also the author of a brochure, *Intellectual Cooperation between the Two Wars* (1943). See further Kolasa, pp. 132-133.
3) See table with original countries in the appendix below.
4) Huxley 1973, p. 24.
5) Wells, p. 11.
6) Unesco, 1972, p. 293.
7) Laves & Thomson, p. xviii.
8) See David Horner elsewhere in this volume.
9) *ibid.*
10) Cited after Sewell, pp. 78-79.
11) M 'Bow 1985 p. 15.
12) Georges Scelle, quoted after Kolasa, p. 129.
13) Kolasa, p. 138.
14) According to René Maheu, Unesco, 1972, p. 296.
15) Cited after Sewell, p. 77.
16) Laves & Thomson, p. xix.
17) Kolasa, Appendix iii, p. 175.
18) Wells, p. 45.
19) Huxley, 1946.
20) *Ibid.*, p. 21.
21) Weingart, p. 282.
22) Sewell, p. 132.
23) Huxley, 1946, p. 12.
24) *Ibid.*, p. 13.
25) *Ibid.*, p. 33.
26) Sewell p. 79.
27) *Ibid.*, p. 109.
27) cited after Sathyamurthy, p. 99

29) Auger had worked with the French Atomic Energy Program, the CEA. He resigned from it in the Spring of 1948 after being denied a more senior executive position by Fréderic Joliot. Two years later Joliot himself was dismissed from the CEA, having all too openly declared his pro-Soviet sympathies, in connection with the Conference of the Movement of Partisans for Peace in Stockholm, where he presided over the meeting and was the first to sign the Stockholm Appeal; he called scientists to civil disobedience, to refuse to work on anything that might be connected to the military, since this was seen as a contribution to preparation of war against the Soviet Union. Bertrand Goldschmidt, *Atomic Rivals* (Rutgers University Press, New Brunswick and London, 1990), pp. 346-348.

30) Sathyamurthy p. 107.

31) Subventions to non-governmental international organisations represented 5.2% of the total budget in 1951. The figure had dropped to 5% in 1961, and 2.2% in 1971. This was of course compensated by a substantial increase of contracts which these organisations were given, a form that brought with it some strings attached. Cf. Maheu, in Unesco 1972, p. 295 note 1.

32) Behrman, p. 101.

33) Unesco/C/ Prog. Comm./S.C./Nat. Sc./ V.R. 1. 30 Nov. 1946, pp. 1-2.

34) *Ibid.*, p. 4.

35) *Ibid.*, p. 5; later Needham changed his terminology, speaking of the "zone which is still not so bright".

36) *Ibid.*, p. 11.

37) Needham 1945, p. 3; also Needham 1948, pp. 19-21.

38) Richard M. Field to Dr. Cannon undat. prob. late Sept. or early Oct. 1945; this is part of a correspondence prompted by H.T. Tizard's request to Cannon, one of the authors of the socalled *Cannon-Field Memorandum* on ICSU (cf Cannon and Field 1945), to comment on the danger that putting science into Unesco might make for a very bureaucratic organisation. In the reply to his colleague (Cannon), Field notes how Tizard does not even mention Needham. Correspondence in ICSUs archive in Paris.

39) Field to Canon, *ibid.*

40) Needham 1945, p. 1.

41) *Ibid.*

42) Needham 1948, p. 21.

43) Brunauer, p. 12.

44) Laves & Thomas, p. 138.

45) Werskey, p. 203.

46) Cited after Sewell, p. 94.

47) Sewell, p. 78.

48) Elzinga Aant (ed.) 1993, Changing Trends on Antarctic Research. (Kluwer Publishers, Dordrecht).

49) Sewell, pp. 177-178.

50) Behrman p. 22.

51) Auger 1950, p. 9.

52) Snow 1954; Hultberg 1990, p. 177.

53) Auger 1952, p. 80.

54) Auger 1961.

55) Unesco C/ Prog,. Com./S.C./ Nat. Sc. /V.R. 1 30 Nov 1946, p. 10.

56) For a detailed study of the rise and fall of the UNAEC see Regis Cabral, "The United Nations Atomic Energy Commission: Science for International or National Security? 1945-1949, in Regis Cabral (ed.), *Debating the Nuclear. Science, technology, ideology, culture - acomparative research project* (STIC) report no. 7, Gothenburg University, 1994, pp. 11-55.

57) Cited after Margaret Gowing & Lorna Arnold, *Independence and Deterrence. Britain and Atomic Energy, 1945-1952,* vol. 2 (MacMillan, London 1974), p. 227.

58) For some of the early difficulties in brining the founder nations together to actually realize the project see e.g. A. Hermann, J. Krige, U. Mersits, and D. Pestre, *History of CERN, Volume II. Building and Runing the Laboratory* (Amsterdam: North Holland 1990).

59) Gunnar Skogmar, Atompolitik. *Sambandet mellan militärt och civilt utnyttjande av atomenergin i amerikas utrikespolitik,* Lund Political Studies 27, 1979, pp. 133-142.

60) Laves & Thomson, p. 197ff.

61) *Ibid.*, p. 199.

62) Unesco, 1972, p. 40.

63) A useful historical review of S&T at Unesco written during this period may be found in Y. de Hemptinne 1964; part I of this document deals explicitly with international cooperation.

64) Cf his chapter on science in Unesco, 1972, pp. 69-94, which also provides a useful review for the period.

65) Unesco, 1972, p. 303.

66) *Ibid.*, pp. 93-94.

67) Baker 1963.

68) Baker, 1986, p. 11; the international results of the IBP have been published in a series of 26 volumes. In addition national results in different countries have appeared in further publications, in one country in more than 30 volumes (Baker 1988, p.4).

69) Sewell, p. 249. The initial event was the intergovernmnetal conference at Unesco Sept. 4-13, 1986, which came to be known as the "Biosphere Conference". Apart from the UN, FAO and WHO it also involved the cooperation of the IUCN and ICSU's IBP. More than 300 delegates from 60 countries met. Victor Kovda's paper to the conference was wide in scope, taking up what we today call "sustainable development".

70) *Op. cit.*, note 61.

71) Sewell, p. 7.

72) Unesco 1979, pp. 42-43.

73) Cavallin, p. 4.

74) *Ibid.*, p. 7 and p. 57.

75) Rose & Rose, p. 187.

76) Much of the credit for bringing on board the first round of countries belongs to the then Director of the Science Policy unit, Y. de Hemptinne, who had a wide net of personal contacts in this field.

77) Elzinga & Jamison.

78) Baark *et. al.*, p. 25.

79) Sewell, p. 318.

80) Brian Martin and Evellen Richards, "Scientific Knowledge, Controversy, and Public Decision-Making", in Sheila Jasanoff *et. al.* (eds.), *Handbook of Science and Technology Studies* (SAGE, London 1994), Ch. 22.

81) Wells p. 3.

82) The full title of the Media Declaration was – Declaration of Fundamental Principles concerning the Contribution of the Mass Media to Strengthening Peace and International Understanding, to the Promotion of Human Rights and to Countering Racialism, *Apartheid* and Incitement to War.

83) Wells, p. 98.

84) The full text may be found in Wells, Appendix II, pp. 199-207.

85) Said, pp. 191-192.

86) Said, p. 192.

87) Robertson, p. 8.

88) Lenyel, p. 5.

89) *Ibid.*, p. 11.

90) Cited after Sewell, p. 166.

91) *Ibid.*

92) Ibid., p. 213.

93) Ibid., p. 196.

94) Laves & Thomson, p. 87.

95) For René Maheu's philosophy, see his book of 1966, the title of which is already suggestive (*La civilisation de l'universel : inventaire de l'avenir*).

96) Rose & Rose, p. 187.

97) Julian Huxley, "New Bottles for New Wine: Ideology and Scientific Knowledge", in *New Bottles for New Wine*, Chatto & Windus, London 1957, pp. 93-127; quote from p. 123.

98) Unesco, 1972, pp. 283-284.

99) During the Korean War Unesco was mobilised to "educate" people with the US and Western picture of the world. For the emergence of the Cold War see Wittner 1974; Zhadanov's doctrine of Two Camps. is outlined in his speech at the Cominform meeting 1947 (Proceedings Cominform 1947, pp. 3-27).

100) The entry of the Peoples Republic of China on the 29th of October 1971, to replace Nationalist regime in Taipei was a major event in this respect, making the PRC the legitimate representative of China in Unesco; for the case of Antarctica see Elzinga 1993a and 1993b.

101) Baark *et. al.*, p. 3.

102) Mulkay 1979.

103) The format and detailed plan of chapters, focal points and lead authors was decided upon at the IPCC meeting in Harare, Zimbabwe 11-13 Nov. 1992.

104) For an outline of the structure and proposed topics of the three reports see the appendix of the NOAA report (*op. cit.* above).

105) "The Group of Seventy-Seven (G 77) – although the Group at present consists of 126 countries – is by no means a homogeneous group of countries. In the scientific assessement there is, obviously, a natural tendency to focus on particular problems that they consider important" Bert Bolin, "A Joint Scientific and Political Process for a Convention on Climate Change", in Gunnar Sjöstedt *et. al.* (eds.), *Environmental Negotiations, Process, Issues and Contexts* (Swedish Institute of International Affairs and Forskningsrådsnämnden FRN, Stockholm 1993, FRN-report 93: 1, pp. 155-166, quote on p. 161.

106) B. Latour S. Woolgar, *Laboratory Life. The Social Construction of Scientific Facts* (Beverly Hills and London: Sage 1979), further developed by Arie Rip, "Contextual Transformations in Conetmporary Science", in Andrew Jamison (ed.), *Keeping Science Straight* (Department of Theory of Science, Univ. Göteborg 1988), report no. 156, pp. 59-85, esp. p. 60 and 70; see also Barry Barnes, *About Science* (Basil Blackwell, Oxford 1985), p. 46.

107) See further Elzinga 1963a.

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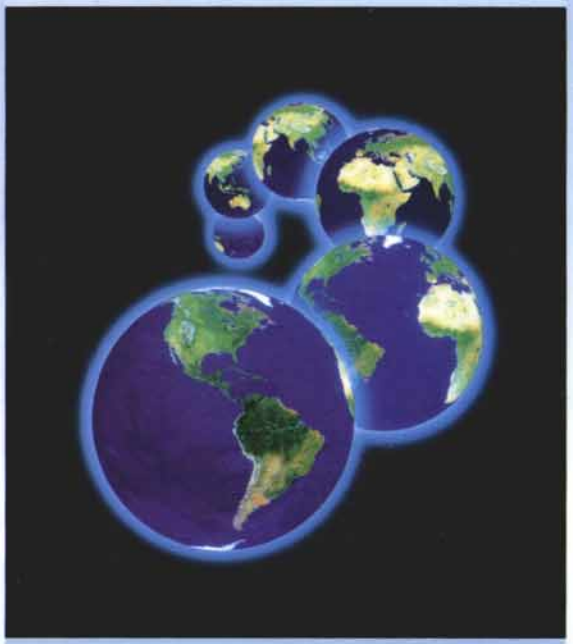

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